

WHAT IS CLAIMED IS:

1. A coil system for a medical imaging system, the coil system comprising:

a first coil of a medical imaging system;

a second coil of the medical imaging system; and

a balun device connected to the first and second coils, the balun device configured to decouple the first and second coils of the medical imaging system.

2. A coil system in accordance with claim 1 wherein the balun device comprises one of a coaxial cable, strip-line device, micro-strip device, phase shift network and balun network.

3. A coil system in accordance with claim 1 wherein the medical imaging system comprises a magnetic resonance imaging (MRI) system and the first and second coils comprise resonant surface coils.

4. A coil system in accordance with claim 1 further comprising a balun capacitor in connection with the balun device.

5. A coil system in accordance with claim 1 further comprising a compensation capacitor in series connection with each of an end of the balun device.

6. A coil system in accordance with claim 1 further comprising a decoupling capacitor in connection with each of the first and second coils.

7. A coil system in accordance with claim 1 further comprising a compensation capacitor in series connection with each of an end of the balun device, and wherein the value of each compensation capacitor is configured to have a reactance equal to one-half an inductive reactance of the balun device.

8. A coil system in accordance with claim 1 further comprising a balun capacitor in connection with the balun device, the value of the balun capacitor determined based upon the type and length of the balun device.

9. A coil system in accordance with claim 1 further comprising a decoupling capacitor and a plurality of tuning capacitors in connection with each of the first and second coils.

10. A coil system in accordance with claim 1 wherein the first and second coils are separated by a gap.

11. A system for decoupling coils in a medical imaging system, the system comprising:

balun means connected between coils of a medical imaging system for decoupling the coils; and

connection means for connecting the balun means to the coils.

12. A system in accordance with claim 11 wherein the connection means further comprises compensation means for compensating for phase shift in the balun means.

13. A system in accordance with claim 11 further comprising decoupling means connected to each of the coils for canceling mutual inductance between the coils.

14. A system in accordance with claim 11 further comprising tuning means connected to each of the coils for tuning each of the coils.

15. A system in accordance with claim 11 wherein the balun means comprises inductive components.

16. A system in accordance with claim 11 wherein the balun means comprises inductive and capacitive components.

17. A system in accordance with claim 11 wherein the connection means comprises capacitive components.

18. A system in accordance with claim 11 wherein the medical imaging system comprises a magnetic resonance imaging (MRI) system and the coils comprise resonant surface coils.

19. A system in accordance with claim 11 wherein the coils are separated by a gap.

20. A method for decoupling coils in a medical imaging system, the method comprising:

configuring a balun for connection between coils in a medical imaging system to decouple the coils.

21. A method in accordance with claim 20 further comprising configuring the coils for connection to the balun to decouple the coils.

22. A method in accordance with claim 20 wherein the coils are separated by a gap.